PATENT SPECIFICATION

1,172,449

DRAWINGS ATTACHED

1,172,449

Date of filing Complete Specification (under Section 3 (3) of the Patents Act 1949): 24 July, 1968.

Date of Application (No. 34223/67): 26 July, 1967.

Date of Application (No. 27347/68): 8 June, 1968.

Complete Specification Published: 26 Nov., 1969.

Index at acceptance:—H4 D(23X, 234, 276, 396, 513, 550, 560, 562, 718, 746, 747, 748, 756, 778, 787); A6 D(1C2, 1C5, 1C8)

International Classification:—A 63 b 43/00

COMPLETE SPECIFICATION

Improvements in or relating to Golf Balls

I, AXEL CHARLES WICKMAN, a Citizen of the United States of America, of 69, South Washington Drive, St. Armands Key, Sarasota, Florida, United States of America, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to golf balls. During a game of golf quite an amount of time can be spent in trying to find a ball that has been lost in the rough. An object of the present invention is to facilitate the location of the lost golf balls.

According to one aspect of the invention a golf ball bears means for transmitting radiation of an intensity that is sufficient for the golf ball to be located after loss in long grass or the like by a person using a suitable radiation detector in the area in which the golf ball was lost.

The means for transmitting radiation may be a radiation emitter. This radiation emitter may be a radio-active material which emits a radio-active radiation of an intensity that is insufficient to be injurious to a human being. Preferably the radio-active material has a long half-life relative to the normal life of a golf ball whereby the intensity of the radio-active radiation will remain substantially constant throughout the normal life of the golf ball, and the radio-active material is so arranged that the radio-active radiation will be emitted with a predetermined substantially even intensity in all directions. The core of the golf ball can contain at least some of said radio-active material. Similarly, the moulded outer case of the golf ball can contain at least some of said radio-active material. At least some of said radio-active material may also be contained in a layer of paint or the like adhered to the outer surface of the golf ball.

The radiation emitter may be a micro radio emitter arranged in the core of the golf ball. Preferably the radio emitter is so arranged that the radio radiation will be emitted with a predetermined substantially even intensity in all directions.

The means for transmitting radiation may be a radiation reflector arranged for reflecting radiation from a radiation emitter associated with the radiation detector. In the case where the radiation reflector is in the form of radiation reflective material, the moulded outer case of the golf ball may contain at least some of the radiation reflective material. At least some of the radiation reflective material may be contained in a layer of paint or the like adhered to the outer surface of the golf ball. If the outer casing of the golf ball is substantially transparent to the radiation to be reflected, the core of the golf ball may contain at least some of said radiation reflective material.

According to another aspect of the invention, a detector for locating a radiation reflective golf ball preferably includes a radiation emitter, a reflected radiation detector sensitive to the direction in which radiation reflected from a small reflective area is received, and a meter means which is sensitive to the intensity of reflected radiation received by the reflected radiation detector and is calibrated with the distance the golf ball would have to be spaced from the detector to reflect the intensity of radiation received, the radiation emitter may be a small radio emitter arranged to emit radio radiation with a predetermined substantially even intensity either in all directions or in a specific beam.

On the other hand, a detector for locating a radiation emitting golf ball, preferably includes a radiation detector sensitive to the direction in which radiation emitted from a small source is received, and a meter means which is sensitive to the intensity of radiation

received by the radiation detector and is calibrated with the distance the golf ball would have to spaced from the detector to produce the intensity of radiation received.

So that the invention may be fully understood, several embodiments are now described, by way of example only, with reference to the accompanying drawings, in which:—

Figures 1 to 4 are part sections through different constructions of golf balls, and

Figures 5 to 7 illustrate apparatus for use in locating a lost golf ball of the types illustrated in Figures 1 to 4.

It should be noted that all of the golf balls 10 illustrated in Figures 1 to 4 have a moulded plastic outer casing 11 surrounding a two-part core comprising a wound rubber filament zone 12 embracing a central spherical rubber bag 13 containing the usual liquid composition 14.

The golf ball 10 illustrated in Figure 1 has a radio-active material 15 evenly distributed in the liquid composition 14 forming the centre of its core so that radio-active radiation will be emitted with a substantially even intensity in all directions. It should be noted that the materials sued for manufacturing the golf ball 10 should be chosen so they do not hinder unduly the passage of the radiation, and the radio-active material should be chosen to have a long half-life relative to the normal life of a golf ball 10 so that the intensity of the radio-active radiation will remain substantially constant throughout the normal life of the golf ball. The quantity and nature of the radio-active material should be chosen so that the resulting intensity of radiation will not be injurious to a human being handling the golf ball 10, and the radiation will have sufficient range to be detected at a distance of at least ten feet by a radiation detector such as a Geiger counter. Preferably the radiation should be capable of detection at a range of at least fifty feet. The choice of the radio-active material 15 will depend, as stated, on the materials used to manufacture the golf ball.

As shown in Figure 6, the only remaining piece of equipment that is necessary to locate the golf ball 10 after it has been lost in a particular area 16 of a golf course is a cheap battery operated Geiger counter 17. This instrument is supported by the golf bag 18 and is provided with a pair of earphones 19 for the golfer to use when the ball 10 is lost. The Geiger counter 17 is of the type that is sensitive to the direction in which radiation emitted from a small source is received and produces a signal, in the form of the usual ticking signal applied to the earphones 19, which signal increases with the intensity of the radiation received. With this type of Geiger counter, the procedure for finding a golf ball 10 lost in the rough 16 is for the golfer to walk to the estimated area in which loss occurred, to switch on the Geiger counter 17 and to plug in the earphones 19. The Geiger counter 17 is preferably arranged on the golf bag 18 so that its direction of sensitivity points forwards with relation either to a trolley 20 supporting the golf bag, or to unshown carrying straps of the golf bag. In this manner the approximate direction of the golf ball 10 is located merely by the golfer orientating either the trolley 20, or his trunk if he is carrying the golf bag 18, until the direction of strongest signal from the Geiger counter 17 is found. All that is left is for the golfer to walk in the direction of strongest signal until the exact location of the golf ball 10 is detected. The strength of the earphone signal will indicate the distance of the golf ball 10.

If desired, the Geiger counter can be more elaborate and be specifically designed for the purpose of finding the golf ball. For instance, as shown in Figure 5, a Geiger counter 21 is provided with a meter 22 which is sensitive to the intensity of radiation received by the Geiger counter, and has a dial 23 which is calibrated with the distance the the golf ball 10 would have to be spaced from the Geiger counter 21 to produce the intensity of radiation received. Thus the Geiger counter 21 would by its orientation indicate the direction of the lost golf ball 10, and by its meter reading 23 would indicate the distance to be travelled to reach the golf ball 10. However, for this refinement to be effective, it will be appreciated that the golf ball 10 must either have a predetermined intensity of radiation, or the meter 22 of the Geiger counter must have an intensity control 24 so that the meter 22 can be tuned to the intensity of radiation emitted by the golf ball before the game is started.

Instead of arranging the radio-active material 15 entirely in the core 12, 13, 14 of the golf ball 10, part or all of the radio-active material 15 may be evenly distributed in the moulded outer case 11 as shown in Figure 2. The radio-active material 15 is preferably incorporated in the golf ball 10 during its manufacture, but may be applied to the golf ball 10 after manufacture either by subjecting the golf ball 10 to a suitable radiation, or by coating the ball with a layer of radio-active paint 25 or the like as shown in Figure 3.

Figure 4 illustrates an embodiment of the invention in which no radio-active materials are used and, instead, a micro radio emitter 26 is arranged in the liquid composition 14 forming the centre core of the golf ball 10. The micro radio emitter 26 is arranged to emit a radiation of predetermined strength, frequency and amplitude for receipt by a suitable detector of radio radiation which takes the place of the Geiger counters 21 and 17 illustrated in Figures 5 and 6. The micro radio emitter 26 must be very light so as to have little or no influence on the playing characteristics of the golf ball 10, should be extremely robust and simple so as to minimise the

possibility of damage when the golf ball is struck, and should be capable of emitting the predetermined radio radiation at a substantially even intensity for a considerable length of time. One advantage of this particular embodiment is that each golf ball 10 can be arranged to emit a distinct signal of its own so that the player will only detect his own ball.

In a preferred embodiment of the invention the radio-active material 15 illustrated in Figures 1 and 2, or the radio-active paint 25 illustrated in Figure 3, is replaced by a radiation reflective material. In this manner, the radiation reflective material will be evenly distributed in or over the moulded outer case 11 so that radiation impinging on any aspect of the outer case 11 will be reflected with a substantially even intensity. Preferably the radiation reflective material is incorporated in the paint 25 or the like with which the golf ball 10 is coated as shown in Figure 3. Alternatively the radiation reflective material may be incorporated in the golf ball 10 during its manufacture by even distribution in the moulded outer case 11 as described with reference to Figure 2. If the radiation reflective material is to be arranged in the moulded outer case 11, it should be noted that the material used for manufacturing the outer casing 11 should be chosen so that it is generally transparent to the passage of the radiation that is to be used. The quantity and nature of the radiation reflecting material should be chosen so that the resulting intensity of radiation reflected from any aspect of the golf ball 10 will be substantially constant and will have sufficient range to be detected at a distance of at least ten feet by a reflected radiation detector such as a radio receiver. Preferably the reflected radiation should be capable of detection at a range of at least fifty feet. The choice of the radiation reflecting material will depend, as stated, on the type of radiation to be reflected and, if it is to be arranged inside the golf ball, will also depend on the materials used to manufacture the golf ball.

As shown in Figure 7, the only remaining piece of equipment that is necessary to locate the golf ball 10 after it has been lost in a particular area 16 of the golf course is a cheap battery operated emitter 27 of radio waves 28 and a corresponding radio receiver 29 for the reflected radiation 30. This instrument is preferably supported by the golf bag 18 as shown in Figures 5 and 6 and may be provided with a pair of earphones 19 for the golfer to use in a similar manner to that taught with reference to Figure 6. In this event the radio receiver 29 is of the type that is sensitive to the direction in which the reflected radiation 30 is received and produces a signal, in the form of a ticking signal applied to the earphones 19, which signal increases with the intensity of the reflected radiation received. With this type of radio receiver, the procedure for finding a golf ball 10 lost in the rough 16 would be for the golfer to walk to the estimated area in which loss occurred, to switch on the radio wave emitter 27 and associated radio receiver 29 and to plug in the earphones 19. The radio receiver 29 is preferably arranged on the golf bag 18 so that its direction of sensitivity points forwards with relation either to the trolley 20 or to unshown carrying straps of the golf bag. In this manner the approximate direction of the golf ball 10 is located merely by the golfer orientating either the trolley 20, or his trunk if he is carrying the golf bag 18, until the direction of strongest signal from the radio receiver 29 is found. All that is left is for the golfer to walk in the direction of strongest signal until the exact location of the golf ball 10 is detected. The strength of the earphone signal will indicate the distance of the golf ball 10.

If desired, the radio wave emitter 22 and the radio receiver 29 can be more elaborate and be specifically designed for the purpose of finding the golf ball. For instance, the arrangement already described with reference to Figure 5 may be employed, the radio receiver 29 could be provided with the meter 22 sensitive to the intensity of reflected radiation 30 received, the dial 23 being calibrated with the distance that the golf ball 10 would have to be spaced from the radio receiver 29 to produce the intensity of reflected radiation received. Thus the radio receiver 29 would by its orientation indicate the direction of the lost golf ball 10 and by its meter reading 23 would indicate the distance to be travelled to reach the golf ball 10. However, for this refinement to be effective, it will be appreciated that the golf ball 10 must either have a predetermined capacity for reflecting radiation, or the meter 22 of the radio receiver 29 must have the intensity control 24 so that the meter 22 can be tuned to the intensity of radiation reflected by the golf ball 10 before the game is started.

Instead of arranging the radiation reflecting material entirely in or on the moulded outer case 11 of the golf ball, part or all of the radiation reflecting material may be evenly distributed in the core 12, 13, 14 of the golf ball as taught with reference to Figure 1, provided that the moulded outer case 11 and any other external layers 12, 13 or 14 are manufactured from material that is generally transparent to the radiation that is to be reflected.

WHAT I CLAIM IS:—

1. A golf ball, which bears means for transmitting radiation of an intensity that is sufficient for the golf ball to be located after loss in long grass or the like by a person using a suitable radiation detector in the area in which the golf ball was lost.

2. A golf ball, according to Claim 1, in which the means for transmitting radiation is a radiation emitter.

3. A golf ball, according to Claim 2, in

which the radiation emitter is a radio-active material which emits a radio-active radiation of an intensity that is insufficient to be injurious to a human being.

4. A golf ball, according to Claim 3, in which the radio-active material has a long half-life relative to the normal life of a golf ball whereby the intensity of the radio-active radiation will remain substantially constant throughout the normal life of a golf ball, and the radio-active material is so arranged that the radio-active radiation will be emitted with a predetermined substantially even intensity in all directions.

5. A golf ball, according to Claim 3 or 4, in which the core of the golf ball contains at least some of said radio-active material.

6. A golf ball, according to any of Claims 3 to 5, in which the moulded outer case of the golf ball contains at least some of said radio-active material.

7. A golf ball, according to any of Claims 3 to 6, in which at least some of said radio-active material is contained in a layer of paint or the like adhered to the outer surface of the golf ball.

8. A golf ball, according to Claim 2, in which the radiation emitter is a micro radio emitter arranged in the core of the golf ball.

9. A golf ball, according to Claim 8, in which the radio emitter is so arranged that the radio radiation will be emitted with a predetermined substantially even intensity in all directions.

10. A golf ball, provided with a radio-active core, constructed and arranged and adapted to operate substantially as described herein and as shown in Figure 1 of the accompanying drawings.

11. A golf ball, provided with a radio-active moulded outer case, constructed and arranged and adapted to operate substantially as described herein and as shown in Figure 2 of the accompanying drawings.

12. A golf ball, covered with a radio-active layer of paint or the like, constructed and arranged and adapted to operate substantially as described herein and as shown in Figure 3 of the accompanying drawings.

13. A golf ball constructed and arranged and adapted to operate substantially as described herein and as shown in Figure 4 of the accompanying drawings.

14. A golf ball, according to Claim 1, in which the means for transmitting radiation is a radiation reflector arranged for reflecting radiation from a radiation emitter associated with the radiation detector.

15. A golf ball, according to Claim 14 and in the case where the radiation reflector is in the form of radiation reflective material, in which the moulded outer case of the golf ball contains at least some of the radiation reflective material.

16. A golf ball, according to Claim 14 or 15 and in the case where the radiation reflector is in the form of radiation reflective material, in which at least some of the radiation reflective material is contained in a layer of paint or the like adhered to the outer surface of the golf ball.

17. A golf ball, according to Claim 14 and in the case where the outer casing of the golf ball is substantially transparent to the radiation to be reflected and the radiation reflector is in the form of a radiation reflective material, in which the core of the golf ball contains at least some of said radiation reflective material.

18. A golf ball, provided with a radiation reflective core, constructed and arranged and adapted to operate substantially as described herein and as shown in Figure 1 of the accompanying drawings.

19. A golf ball, provided with a radiation reflective moulded outer case, constructed and arranged and adapted to operate substantially as described herein and as shown in Figure 2 of the accompanying drawings.

20. A golf ball, covered with a radiation reflective layer of paint or the like, constructed and arranged and adapted to operate substantially as described herein and as shown in Figure 3 of the accompanying drawings.

21. A detector, for locating a golf ball according to any of Claims 1, and 14 to 20, including a radiation emitter, a reflected radiation detector sensitive to the direction in which radiation reflected from a small reflective area is received, and a meter means which is sensitive to the intensity of reflected radiation received by the reflected radiation detector and is calibrated with the distance the golf ball would have to be spaced from the detector to reflect the intensity of radiation received.

22. A detector, according to Claim 21, in which the radiation emitter is a small radio emitter arranged to emit radio radiation with a predetermined substantially even intensity in all directions.

23. A detector, according to Claim 21, in which the radiation emitter is a small radio emitter arranged to emit radio radiation with a predetermined substantially even intensity in a specific beam.

24. A detector, for locating a golf ball according to any of Claims 1 to 13, including a radiation detector sensitive to the direction in which radiation emitted from a small source is received, and a meter means which is sensitive to the intensity of radiation received by the radiation detector and is calibrated with the distance the golf ball would have to be spaced from the detector to produce the intensity of radiation received.

25. A detector, for locating a golf ball according to any of Claims 1 to 13, constructed and arranged and adapted to operate substantially as described herein and as shown in Figure 5 of the accompanying drawings.

26. A detector, for locating a golf ball ac-

cording to any of Claims 1 to 13, constructed and arranged and adapted to operate substantially as described herein and as shown in Figure 6 of the accompanying drawings.

27. A detector, for locating a golf ball according to any of Claims 1 and 14 to 20, constructed and arranged and adapted to operate substantially as described herein and as shown in Figure 7 of the accompanying drawings.

WALFORD & HARDMAN BROWN,
Chartered Patent Agents,
Trinity House, Hales Street,
Coventry, Warwickshire,
England.
Agents for the Applicant.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1969.
Published by the Patent Office, 25 Southampton Buildings, London, W.C.2, from which copies may be obtained.

1172449 COMPLETE SPECIFICATION
2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 1

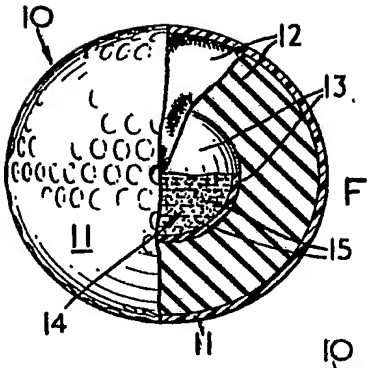

FIG. 1.

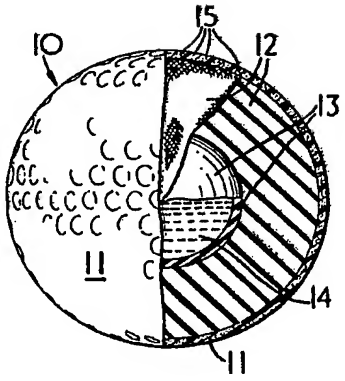

FIG. 2.

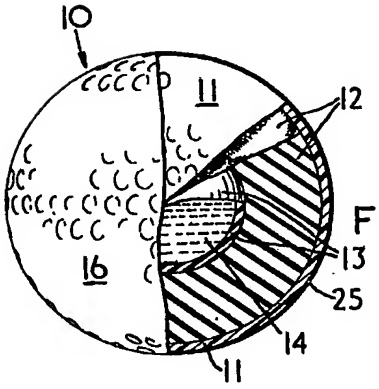

FIG. 3.

1172449 COMPLETE SPECIFICATION
2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 2

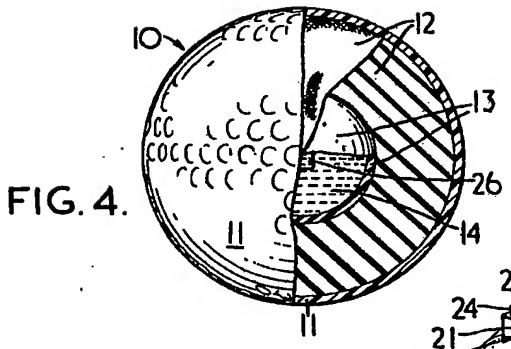

FIG. 4.

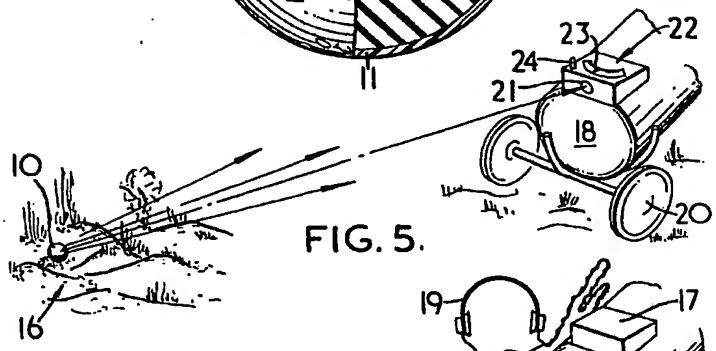

FIG. 5.

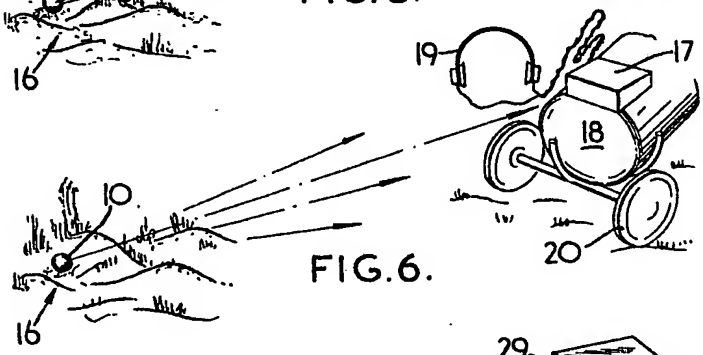

FIG. 6.

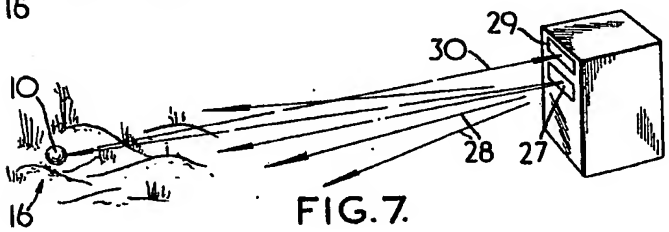

FIG. 7.